10.6 SUMMARY

In this unit, you have learnt about the role of transaction processing in data retrieva!. Two important areas of the functional management say marketing and human resource management. As each of the sub-systems perform specific operations1 transactions to support the main system, various inputs required for these subsystem have been discussed in detail. By now you have come to know how the development of the system require to be assisted by the different subsystems in the transaction process.

10.7 UNIT END EXERCISES

1) Identify tlie role of transaction processing system in the development information system.

2) Suggest few modules, you would like to add to improve the Marketing Information System.

3j List tlie analytical methods, which could be used effectively in the modules of human resource management for the development of subsystem.

4) Haw does computerized Personnel Information systems help in managing human resources more efficiently?

10.8 REFERENCES AND SUGGESTED FURTHER READINGS

Course material designed by IGNOU for the programs of Computer and Information Sciences.

Murdick, and Thomas C. Fuller. "Subsystems for MIS". *Journal of Systems Management*, June **1979.**

Murdick, Robert G. *MIS: Concepts and Design.* Englewood Cliffs, N.J. Prentice-Hall, 1980

Robert G. Murdick, Joel E. Ross and James R Claggett. *Information Systems for Modern Management,* Prentice Hall of India, **1997**

UNIT 11 TRANSACTION PROCESSING SYSTEMS-11: OPERATIONS AND FINANCIAL MANAGEMENT

11.1 INTRODUCTION

In the previous unit you have learnt about transaction processing systems in Human Resource Management (I-IRM) and Marketing Management (MM). You have learnt about sub systems of Human Resource Information System (recruitment, retention/ service conditions and retirement). Similarly you have learnt about subsystems of marketing information systems (Sales management, forecasting of sales, market research and advertising).

Businesses today are founded around information systems that have transaction processing as their major component e.g. sales order processing, purchase order processing, accounting, payroll, production and stock (or inventory) control and booking etc. Most of these systems work in conjunction with other systems ta provide management information to support decision-making.

In this unit you would learn about another set of functional areas i.e. Operations Management (OM) and Financial Management (FM). You will learn about subsystems of Operations Management and subsystems of Financial Information Systems. You will learn about methods of computerization of operations and financial functions.

11.2 OBJECTIVES

After reading this unit, you should be able to:

Describe the subsystems of operations Management and their integration;

Identify the components of Inventory Management Systems;

Explain the role of Computerized maintenance management;

- Define various aspects of financial systems: and

- Identify problems associated with computerisation of financial systems,

11.3 TRANSACTION PROCESSING SYSTEMS

Transaction processing *is* defined by online dictionary and search engine whopedia.com as a type of computer processing in which the computer responds immediately to user requests. Each request is considered to be a *transaction.* Automatic teller machines for banks are an example of transaction processing. The opposite of transaction processing is batch processing, in which a batch of requests is stored and then executed all at one time. Transaction processing requires interaction with a user, whereas batch processing can take place without a user being present. An example of batch processing is the way tliat credit card companies process billing. The customer does not receive a bill for each separate credit card purchase but one monthly bill for all of tliat month's purchases. Tlie bill is created through batch processing, where all of tlie data are collected and held until the bill is processed as a batch at the end of the billing cycle.

Transactions are tlie activities tliat are performed on daily basis by most businesses. These could be of two types *viz.* commercial transactions (activities pertaining to buying. selling, offering services or paying bills etc.) and recording or retrieving data (activities pertaining to booking a ticket, registering a customer on a or looking up some information etc). Many a times these transactions are huge in numbers and one requires computer assistance to deal with them. Also tlie speed and accuracy with which tlie information is to be processed should be high level. This has led to development of systems that could process transactions at higher speecl, lesser cost and higher accuracy.

Businesses today are discovering applications that can benefit from a Transaction Processing System, mainly because tliese systems can now be made functional on personal computers. Thus, transaction-processiiig systems are being used to handle many simultaneous users tliat work on tlie same set of data.

A transaction processing system receives tlie data from an input source like a customer and or a barcode or any otlier data-capturing device. Tlie system then performs the transaction, checks it validity and report it in the form of summary or executive report to the management.

Tlie figure given below shows the typical functioning of a transaction processing system.

Figure 11.1: A Typical Transaction Processing System
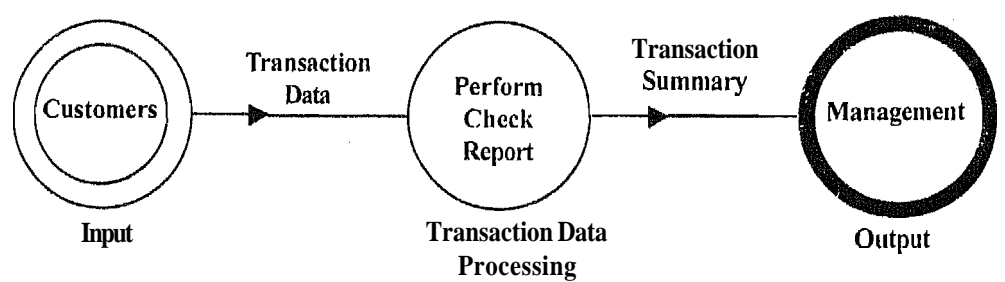
11.4 PRODUCTION/OPERATION SYSTEMS

Tlie operations management discipline consists of a range of areas dealing with the design, operation and control of production systems and subsystems. Operations Management is responsible for tlie translation of resources into products or services tliat customers will buy. It is interconnected with the otlier company functions like

Human Resources, Finance and Marketing. A systems approach takes into account all parts of the system. A system is defined as a collection of persons, objects and procedures for operating within an environment. Every organisation can be considered as a system consisting of interacting sub-systems. A system gathers tlie input and converts it in some useful output by tlie means of a conversion process. *Figure* 11.2 illustrates this.
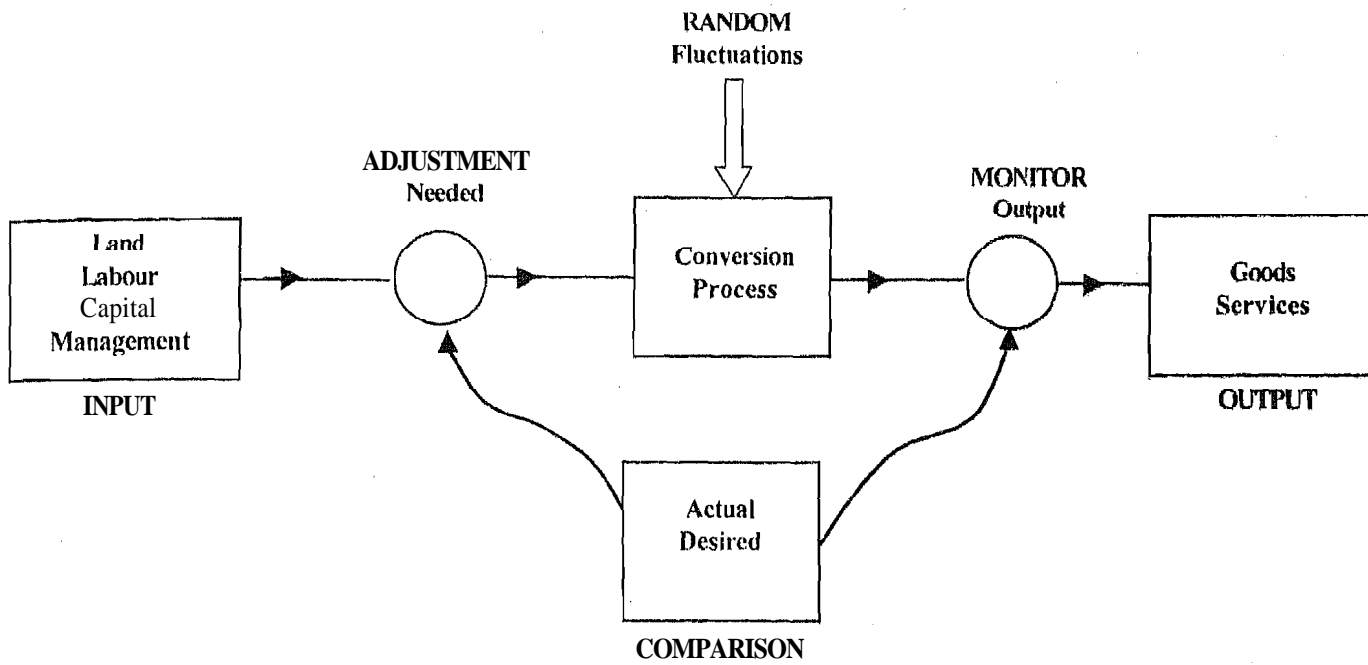
Figure 11.2: Conceptual Model of a **Production/Operations** System

Source: *Adapted from MS-5: Management of Machines and Materials*

However; the focus of operations management has experienced a change. There has been increased attention given to the customer now. Operation managers are now customizing their work progress. They are working to convert raw material into finished products arid simultaneously delivering services to make customers satisfied. The role of tlie operations manager varies in every industry. In general terms, an operations manager looks at every process in the business, breaks it down, analyses it, and makes tlie final product better with a customer centric view. *Figure* 11.3 highlights tlie new focus.
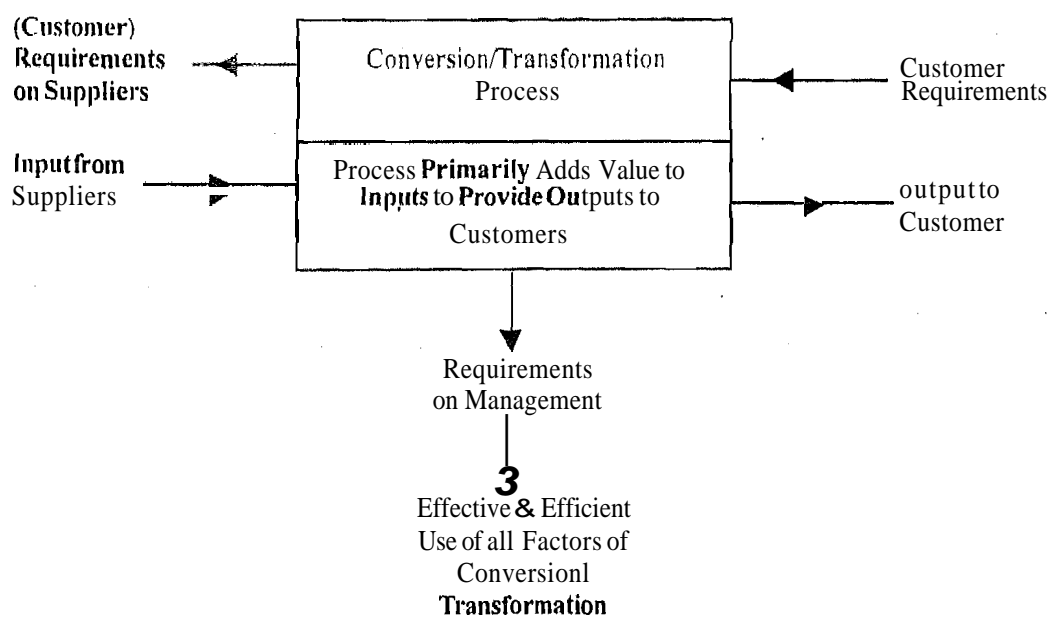

Figure 11.3: New Focus of a **Production/Operations** System

Source: *Adapted from MS-53: Production/Operations Management*

Let us discuss some of the processes that are linked to production1 operations management. Suppose your company wants to launch a new product then it will be the duty of the operations managers to manage the logistics, the costs, the skills, and the equipment necessary for the production of the new product. He would then have works concerning the manufacturing and production processes of that product. Supply chain and logistics activities like purchasing prices and levels, storage of raw materials and inventory comes at tlie next level. After that, the operations manager becomes busy with analysing and improving quality of the product. The operations manager also provides costs for each phase of tlie operation. The operations manager also covers issues like replacement and repair of equipment, which comes under the domain of maintenance. Finally there are facility management issues like environmental regulations, waste management, site locations and employee security that are managed by tlie operations manager.
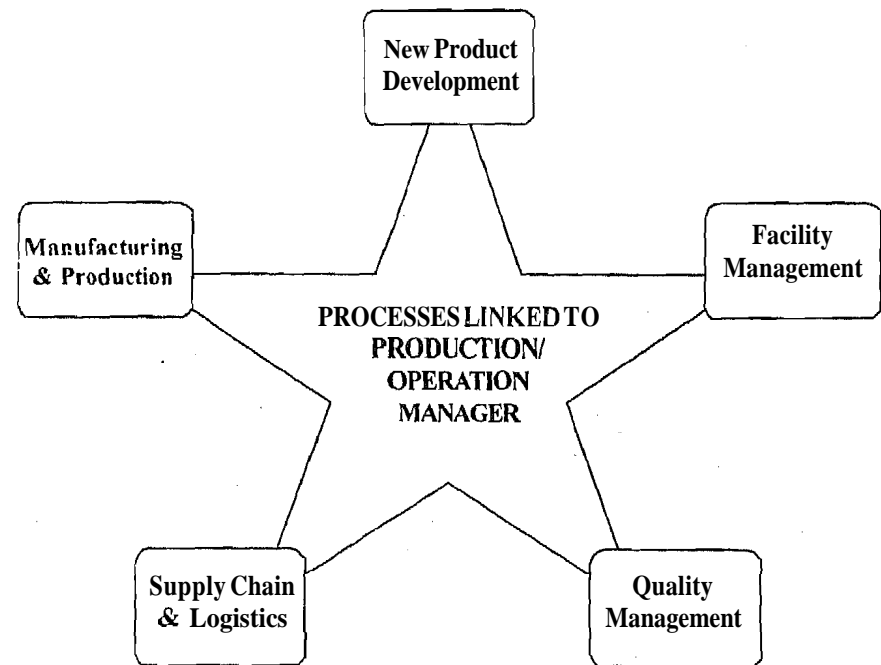
Figure 11.4 : Processes Linked to Production/Operations Manager

11.5 INVENTORY MANAGEMENT SYSTEMS

In any manufacturing set-up, generally a bigger chunk of manufacturing costs are incurred on the raw materials used to produce a product. Inventories are maintained to stock idle resources for future use. Manufacturing organisations keep inventories of raw materials, components tools and equipments and finished goods. Inventories are maintained to avoid the stock out of a product that results in stopping of the progress of the production process. Both low and high level of inventory has its own demerits.

Here are basically two types of inventory management systems: Independent demand and dependent demand. Dependent demand inventory is defined as the inventory of items that are unfinished goods such as components, parts or subassemblies while independent demand inventory is defined as the inventory of finished goods. Independent demand inventory must be forecasted while dependent demand inventory must be calculated.

Figure 11.5 shows that dependent demand inventory management systems can be of three types, namely material requirement planning system (MRP), Just in time system (JIT) or a hybrid of both. Independent demand inventory systems are classified in two models, namely, production economic order quantity model for tlie manufacturers and basic EOQ model. The basic EOQ model is further classified depending on the requirement
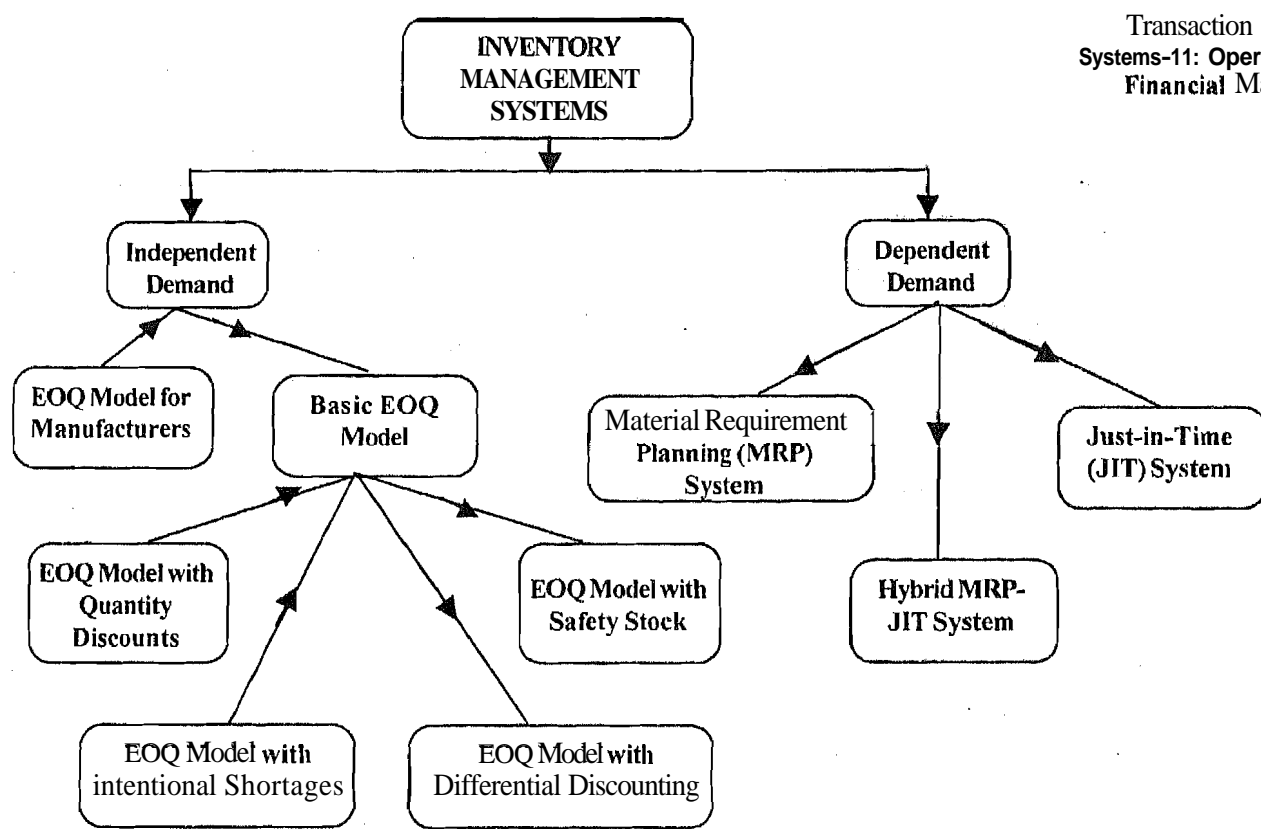
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                        ┌──────────────┐
                        │  INVENTORY   │
                        │  MANAGEMENT  │
                        │   SYSTEMS    │
                        └──────────────┘
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Figure 11.5: **Types of** Inventory Management Systems

Source: *Adapted from Kanishka Bedi (2004) Production & Operations Management,*
Oxford University Press, Delhi

Tlie economic order quantity models helps in finding tlie optimal level of inventory.
Tlie production model of inventory helps in determining tlie optimal size of a
population lot when sales and production takes place simultaneously. Now there are
software programs that allow accurate pinpointing of process tlows and timing of
supply needs. Tlie benefits of JIT model are that tlie order comes in when one need it
so long term storage of supplies is not necessary, It refers to producing or obtaining
only what is needed, when it is needed and in just tlie amount needed. There is no or
low cost incurred in holding the inventory. Material Requirement Planning (MRP)
systems can help in planning and determining tlie supply needs and timelines for new
manufacturing processes. They help in predicting delivery times, responding to
changes, and have better- control over tlie various phases of production. MRP is
basically process for determining material, labour and machine requirements in a
manufacturing environment. MRPII (Manufacturing Resources Planning) is tlie
combination of material requirements planning (MRP), Capacity Requirements
Planning (CRP), and Master Production Scheduling (MI'S). MRP was originally
designed for materials planning only. When labour and machine planning were
incorporated it became known as MRPII. Todny tlie definition of MRPII is generally
associated with MRP systems. One can combine tlie master production schedule, tlie
bill of materials and tlie vendor lead times to produce a new schedule of raw
materials purchases with tlie help of MRP. Tlie result is that the materials are
produced on time and thus the cost of raw materials inventory is reduced.

When MRP and JIT are combined then tlie details of tlie production schedules are
shared with tlie vendors so that they can also plan their production schedules
simultaneously with the manufacturer. Tlie combination of the two reduces two
inventory management problems (finished goods at the vendor and raw materials at
the manufacturer) into one (finished goods at the vendor). There is one safety stock
problem not two (Murthy, 2002).

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There are two more subsystems that support the main system manufacturing. These are Computer-Aided Design/ Computer-Aided Manufacturing (CAD/CAM) and Computer-Integrated Manufacturing (CIM). Computer-Aided Design (CAD) is the use of a computer in industrial design applications such as architecture, engineering and manufacturing while Computer-Aided Manufacturing (CAM) is the use of computer aids (hardware and software) in planning, tracking, analysing, and implementing the construction of manufactured items. It is basically that part of Computer Integrated Manufacturing (CIM) that is restricted to the operation and control of manufacturing functions. Computer Integrated Manufacturing (CIM) is thus an integrated use of computer-aided techniques in manufacturing. This includes CAD and CAM. The main prerequisite for CIM is a database that accessible by **all** the disciplines involved in the manufacturing process, such as design, development, manufacture, distribution, billing etc. CIM is an integration of MRP, JIT, CAD and CAM. It brings all these manufacturing systems into one.

Activity A

Prepare a flow diagram of the inventory system in your organization. In which type does it fall?

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11.6 COMPUTERIZED MAINTENANCE MANAGEMENT

You will read about this is more detail in the course MS-57: Maintenance Management. We **have** taken some excerpts from the unit IT-based maintenance management to give you an idea of role of computers in maintenance functions. Though the use of IT has been adopted quite lately for maintenance functions compared to other functions like finance, personnel, materials etc., tremendous progress has been achieved in the use of IT in both the maintenance management and engineering functions. Use of IT in many organizations has resulted in many benefits over the conventional manual systems. Some of these benefits have been indicated in the table given below:

It should be recognized that computers are basically tools in the hands of managers to achieve their objectives. As the famous saying regarding computers 'Garbage in, Garbage out' signifies, sufficient amount of preparatory and systematic analysis would be required, if computerization efforts are to succeed. Indeed, there have also been number of cases where improper use of computers have added to the misery of maintenance managers. Some of the benefits mentioned above have not accrued but exactly the opposite has happened in those companies. Hence the necessity to completely visualize the maintenance function in a systematic fashion and then go for use of computers to achieve the pre conceived benefits.

Table 11.1: Benefits of IT Enabled Maintenance

S.No.	Benefits
1	Reduction in downtime costs
2	Reduction in maintenance costs
3	Reduction in materials costs
4	Reduction in life cycle costs of machinery
5	Increased availability of plant and equipment
6	Reduction in the breakdowns
7	Increased and extended usage life of plant and equipment
8	Improved diagnosis of machine problems
9	Availability of machine, operation and maintenance information in right time and in right perspective
10	Proper planning, scheduling and control of preventive, predictive and corrective maintenance
11	Efficient control of backlogs
12	Better utilization of maintenance resources, men, materials and logistics
13	Availability of History of machines to enable decision making
14	Ensure efficacy and efficiency of reporting systems
15	Better interface amongst maintenance and other functions like operation, materials, quality, safety etc.
16	Reduction in unnecessary paper works, in essence, improvement in the overall productivity and profitability of the organisation.

Source: *MS-57: Maintenance Management*

The *Figure 11.6* explains the conceptual model through which the maintenance function can achieve its objectives on a sustained basis

INPUT
● Manpower
● Materials (Spare Parts)
● Machine Time
● Tools
‾ Information

MAINTENANCE
● Breakdown
● Preventive
  Condition Based
● Planned Corrective

OUTPUT
● Reliability
● Maintainability
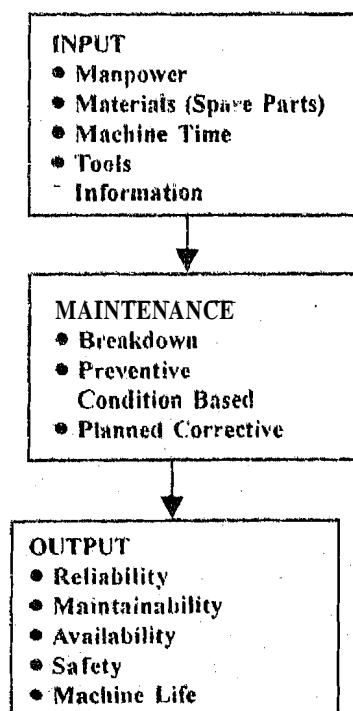● Availability
● Safety
● Machine Life

Figure 11.6 : Input–Maintenance-Output Model

Source: *MS-57: Maintenance Management*

We shall now study tlie common modules present in the computerized maintenance management system (CMMS) software.

Machinery **Information** and Preventive Maintenance **Module:** This module normally contains tlie following facilities:

- Enable querying and printing static equipment information,
- PM work order scheduling by calendar or metered usage & printing of PM work orders.
- Scheduling of multi crafts for performing tlie PM,
- Scheduling PM based on prior completion of PM, request of Maintenance Planning, predictive maintenance results etc.
- Balance PM work load over tlie scheduling period,
- Forward planning to inform production function in advance in case PM requires equipment shutdown.

The preventive maintenance work orders would basically track maintenance labour and materials utilized so that these costs can be calculated and monitored, In addition, the downtime due to preventive maintenance and tlie corrective maintenance requirement also collected for compilation and analysis.

Normally tlie PM software module has the ability to print the work orders in a specific sorted order, the key For which could be the craft, department, priority, etc. independently or in combination. The module also produces various types of reports and queries, some of which are, past due work orders, back log of non-completed work orders, equipment history, equipment wise down time, cost of preventive maintenance, type and number of defects observed and corrected etc.

Corrective Maintenance and Work Order **Module:** The execution of corrective maintenance activities through a well-structured work order system helps a maintenance department with higher availability and reduced costs. Ideally, tlie work order system should produce enough information to enable the maintenance manager take proper decision regarding allocation of the resources to achieve overall improvement in the productivity. Normally the corrective maintenance and work order module has tlie following features:

- Track labour and material utilization and costs thereof,
- Assign different crafts tor different works,
- Identify work orders separately for equipment under warranty,
- Track contracted out maintenance separately,
- Facilitate use of special tools and materials,
- Enable obtaining special permits like safety I electrical lock out etc.,
- Enable scheduling based on various logics like priority of equipment, priority of jobs, material availability, craft etc.,
- Permit input of information related emergency maintenance, which are not scheduled, after they are completed.

Just like tlie PM module. the corrective maintenance module is also capable of producing various types of reports. tlie most important of which are:

- Active and Pending work orders report,
- History of equipment,
- Downtime of equipment,
- Cost of Corrective Maintenance.

Spare Parts Control, **Module:** This module is very similar to a materials management module, which helps in classifying maintenance materials, purchase, inward goods inspection, issue and receipt. It also tracks consumption and controls inventory. The main difference between a materials management computerized software and a spare parts control module would be that of difference in numbers and types and the logics and models used for inventory controls. There could also be renewable spares (also called rotable spares) whose position needs to be tracked separately in tlie spare parts control module. Some of the features of a computerized spare parts module are given below:

- Predictable materials are included in tlie work orders and their need communicated to stores,

- Matching of parts required to availability automatically,

- Automatic reordering based on inventory control/ purchase logic,

- Accumulation of material costs in the history of equipment,

- Linking of equipment data to spare parts data,

- Performance reporting on consumption, inventory, stock outs etc.

Condition Monitoring Module: The modern day computerized software systems for maintenance have a condition monitoring module which can receive equipment performance characteristics like vibration signals, temperature, pressure, lubrication oil condition etc. directly from tlie sensors mounted on tlie critical equipment. These information would be suitably trended and various corrective action like issue of alarms, tripping of tlie equipment, carrying out diagnostics to suggest preventive / corrective maintenance etc. can be performed by tlie software. Since this type of on-line condition monitoring would be quite expensive and may not be feasible for all types of equipment, there are also alternative portable data collector and analyser systems which can be used independently to manually collect tlie condition monitoring data and analyser through a dedicated software.

11.7 FINANCIAL INFORMATION SYSTEMS

Historically, operations such as accounts payable, cost accounting and financial statement preparation were among the first to be automated, via punched cards systems in tlie 1930s and 1940s and on computers in tlie 1950s and 1960s as in payroll procedures. These functions are largely routine, relatively easy to automate. The benefits offered by such applications traditionally liave been in tlie form of clerical cost reduction, and although they liave not normally led to dramatic increases in profitability, they liave produced sufficiently large savings to more than justify their computerisation.

In spite of tlie traditional nature of accounting and finance applications, several sophisticated, high benefit systems are being implemented in this administrative and business area. Cash management, financial modelling and advanced purchasing systems are three examples of tlie new interest in accounting and finance applications.

In large, diversified, or widely dispersed organisations, tlie management of cash resources is a difficult job, yet one that has a large impact on profitability. Failure to invest temporarily available cash, premature payment of obligations, or short-sighted investment programmes that force an organization to borrow at high rates, all result in less than optimal use of financial resources. In an attempt to avoid these problems, many large organizations are using computers to help collect, analyse and report data about cash requirements and reserves. The benefits of such systems include less frequent and smaller short-term loans, lower rates of interest. and higher returns on short-term investments.

Financial analysis of proposals is the second area where computers are playing an increasingly important role. Relatively straightforward simulation models enable the financial manager or analyst to generate pro forma statements that show the financial impact of different proposals, such as adding a new product to a current line or opening a new warehouse. The advantage of such models is that many possible outcomes can be evaluated in the time that one or two could be calculated by hand.

Advanced purchasing systems are the third area of current interest. Computer-based systems monitor the data about price and quantity discounts, product quality and reliability, and speed of delivery. On the basis of these data, computer programme can calculate vendor rankings and economic purchase quantities for individual items and store product information that helps buyers evaluate vendor performance and negotiate favourable contracts with suppliers.

Table 11.2 lists many of the traditional accounting and finance applications as well as those of high current interest.

Table 11.2: **Finance** Systems : Computer Applications

Applications	Least Complex......... ,.. .... - .... Most Complex		
General Accounting	● Cost Record Keeping	Cost Accounting Comparison to Standards or Projected Amounts ● Budgetary Accounting ● Daily Exception Reporting		● Cost Estimating
Accounts Payable (A/P)	● Preparation of A/P Registers ● Check Reconciliation ● A/P Distribution			
Purchasing		● Vendor Analysis − Volume Purchase ● Purchase Order Preparation and Follow-up ● Financial Statement Preparation	● Vendor Analysis − Quality ● Knowing Economic Purchase Quantities ● Requirement Planning e.g. Cash Management System ● Maintenance of Shareholders Records	● Make or buy Analysis · ● Analysis of Finnncial Proposals

Financial systems are primarily concerned with recording business transactions in respect of wages and salaries, purchases, sale sand other aspects of income and expenditure, both capital and revenue. Records of such transactions provide basis for the preparation of periodic or annual profit and loss accounts and balance sheets.

As can be seen, the financial systems of a business are, effectively, accounting systems, which are often, structured as separate systems to the null-financial systems. When systems are computerised, the separately structured systems arc often integrated for economy of data processing and administrative efficiency.

Functions of Financial **Systems**

One of the most important functions of financial systems is to ensure that all business transactions are recorded in proper books of account, on the basis of recognised accounting practice. Such accounting transactions are largely for purposes of custodianship, as a public limited company is responsible to the shareholders − the owners of the business − and accordingly it is essential that the business records portray a true and accurate record of profits and losses, assets and liabilities.

Other function of financial system are summarised below:

Planning and controlling all expenditure, both capital and revenue,

Controlling the receipt and payment of cheques, etc. relating to business transactions and relevant banking transactions,

● Safeguarding the assets of the business in respect of plant and machinery, stocks, debtors and cash,

● Maintaining statutory records ad per Government's regulations,

Preparation of periodic report for statistics, performance and results for internal control and audit.

Activity B

How are the above functions being performed in your organisation? Record your perception about them, function-wise, choosing one of the alternatives given below regarding their performance. .

(i) Satisfactorily (ii) To some extent satisfactorily (iii) Not satisfactorily

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Activity C

What would you suggest to make the system more efficient?

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11.8 FINANCIAL MANAGEMENT SOFTWARE

The microcomputer can provide a new and very efficient tool to improve the service, For example, it can transform efficiency by replacing a large amount of manual record keeping and, perhaps more significantly, it can extend the quality of the service being offered. After introducing a computerised sales ledger, the regular balancing of the ledger (itself a considerably easier task using a controlled computer system) will be accompanied by the printing of an 'aged' list of balances. From this report the accountant can initiate and monitor a follow-up routine to recover any overdue . amounts. In this and similar situations the firm will be offering a much more powerful financial control system that combines the interpretative skills of the accountant with the routine efficiency and analytical capabilities of computerised ledger systems.

Much of the software available for the practicing accountant will, of course, also be of use of his clients as well as to other professional firms. Although some features may be required specifically for the accountant, his management control needs will be very similar to those of other businesses or practices so most programmes offered are described in their publicity material in ways that illustrate their widest possible use, including sues for which they may be only marginally suited. Some of the most widely used financial management software can be listed as:

● General Ledger	Stand alone or integrated, Incorporating budgetary Control and management accounting.
● Sales ledger	
● Purchase ledger	
● Invoicing	
● Stock control	
● CCA adjusted accounts	
●· Pay-roll	
● Modelling techniques	

Figure 11.7: The General Ledger
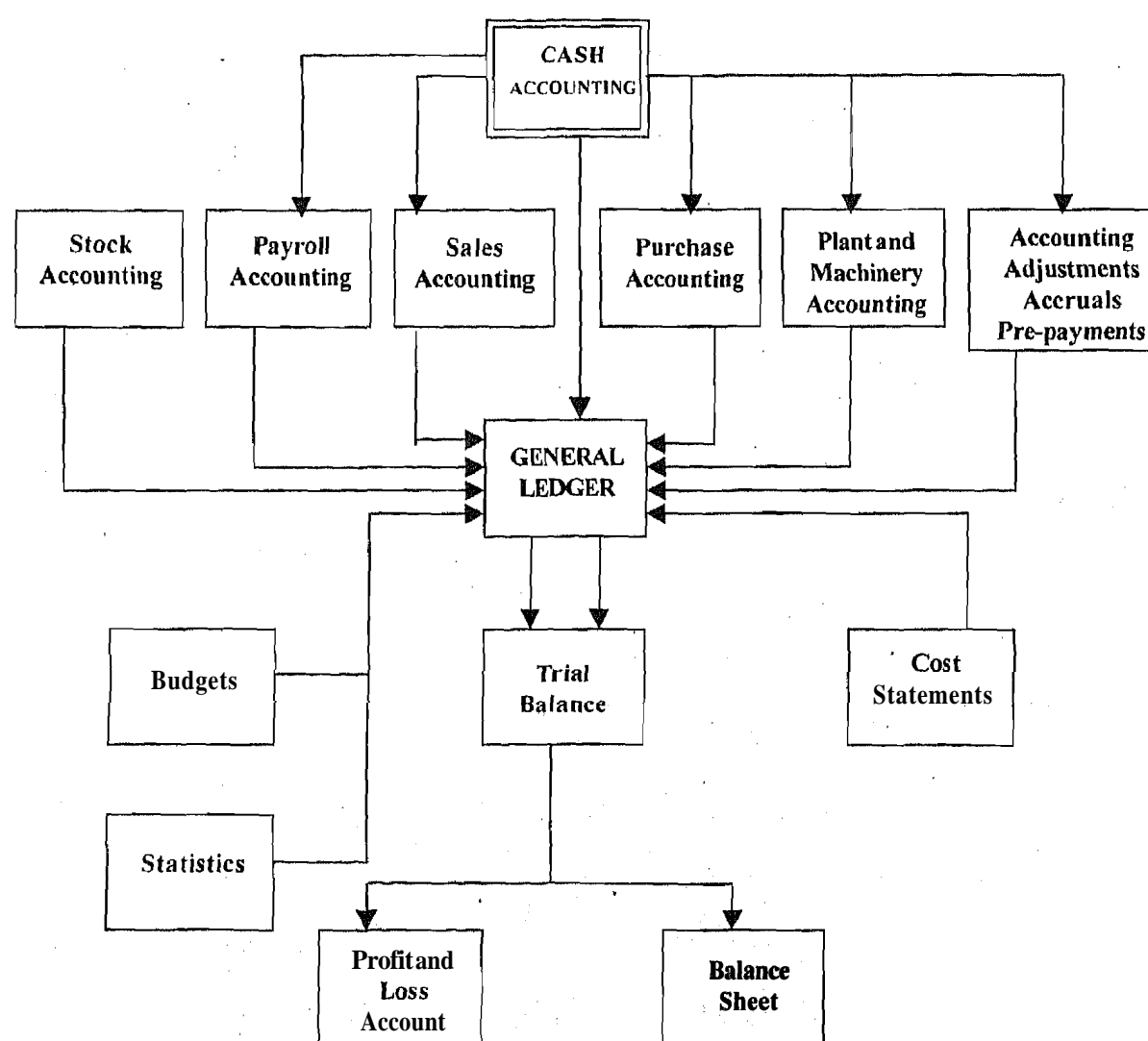
General Ledger

Tlie local point of financial accounting systems in tlie general ledger is sometimes referred to as tlie nominal ledger. The nominal ledger consists of accounts in which transactions are recorded from tlie point of view of business and these are classified as 'impersonal accounts'. Impersonal accounts are sub-divided into 'real accounts' and 'nominal accounts'. Real accounts are concerned with the tangible assets such as plant, machinery and buildings, whereas nominal accounts and concerned with expenses, income, profits and losses. Financial accounting sub-systems are directly related to the general ledger by way of double entry convention for recording of business transactions. In respect of tlie purchase accounting system, tlie general ledger contains tlie purchase ledger control account and accounts from different classes of purchases. Tlie Sales accounting system has accounts in tlie general ledger by way of Sales Ledger control account. Similarly, the wages and salaries accounting system have tlie wages and salaries control account in tlie general ledge,:

Cash transactions, in respect of tlie sub-systems indicated above are affected in the general ledger: for cash receipts from customers, they are recorded in tlie Bank account and tlie Sales ledger control account (*Figure 11.7*).

Computerised General Ledger Systems

Tlie General ledger system on computer can be implemented as an integrated system to form a total system – by combining a number of related sub-systems fro the purpose of improving administrative efficiency. *Figure* 11.8 describes tlie system run chart for one of the general ledger systems.

We shall briefly mention tlie main features of a computerised general ledger system, which are easily available in tlie market:

- Automatic double entry accounting

  Accruals and prepayments are automatically reversed in the next accounting period
- Tlie general ledger is maintained as a database and the Analysis Printing.

Programme can report in any sort. sequence and in many reporting formats, which can be stored on computer.

- When linked with tlie purchase ledger, standard monthly postings can be made automatically,

  A history file of all tlie transaction records can be maintained so that analysis and schedules can be produced at tlie year end,

  Budgetary control can be exercised producing variances from Budget,
- Budget flexing enables budgets to be altered by percentage changes, and produce financial projections as result of the change,
- Nominal accounts can be reanalysed into cost or profit centres, producing reports in up to seven different types of sort keys,
- A year-end report produces summary of each nominal account for each accounting period, compared to budget and or previous years.

Figure 11.8 illustrates computer runs for a general ledger system, which is based on the outline, *Figure 11.7*. The input to run 1 is derived from data produced by the separate computer applications in respect of transactions relating to stocks, pay-roll, sales, purchases, plant and machinery including depreciation, accruals and pre-payments, accounting adjustments and cash. The transactions datas in respect of each application is assumed to be stored on magnetic tape. Run 1 is concerned with consolidating all nominal ledger data and this is achieved by merging all tlie relevant

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transactions on the general ledger codes. The output from Run 1 is a consolidated file of transactions, which is input to Run 2 for updating the general ledger file. This file is stored on magnetic disc to facilitate direct access to relevant general ledger account codes, Run 2 also produce a list of detailed postings to each account.

At the end of the month, the general ledger file is input to Run 3 to produce a Profit and Loss Account and Balance Sheet. The general ledger file is also input to Run 4 together with a budget file, which is updated with actual expenditure providing the cumulative expenditure to date for comparison with budgeted expenditure. A variance report is then printed for analysis by respective cost centres.
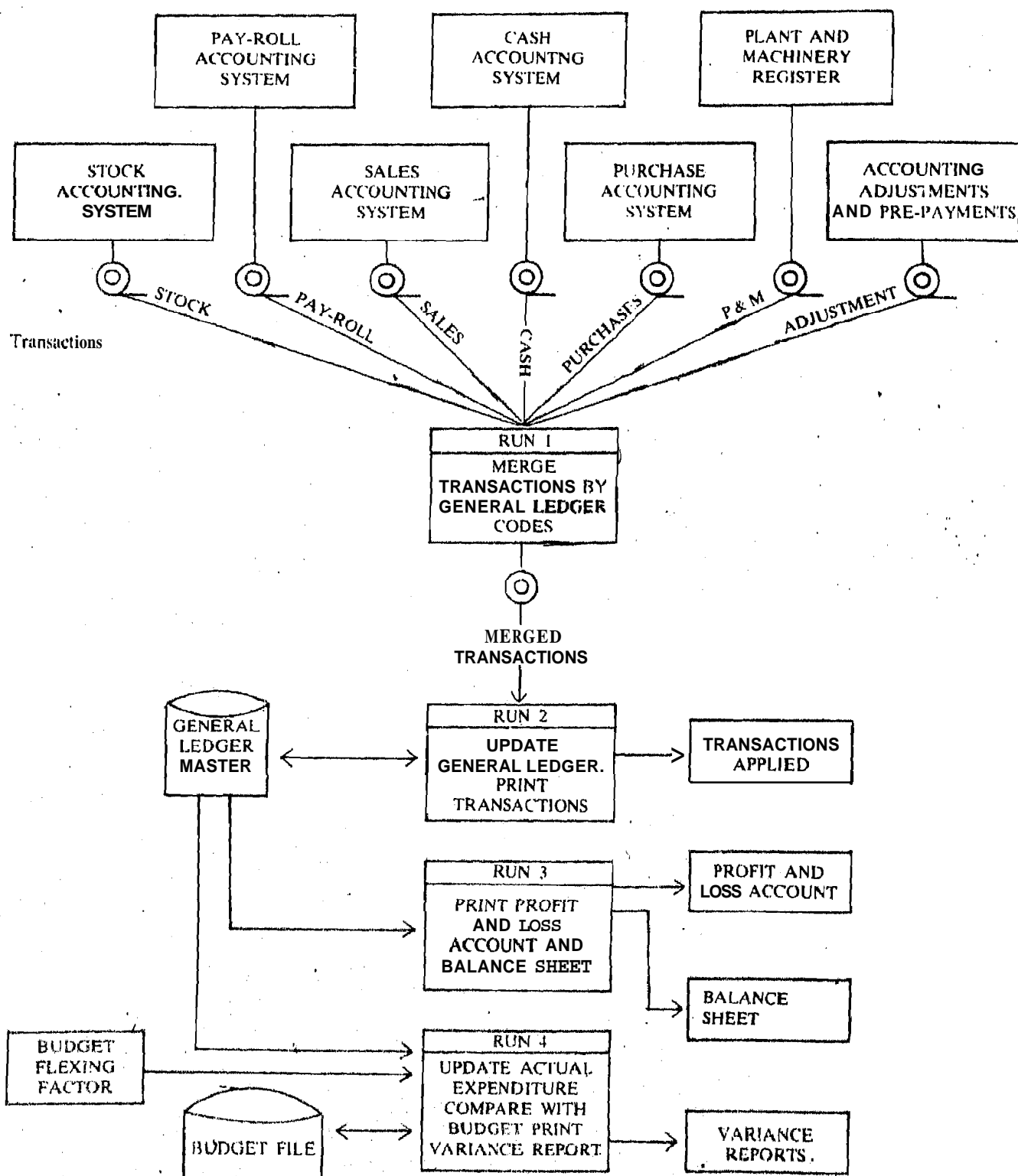

Fig. 11.8: Computerised Integrated General Ledger Systems

incomplete records: This complex area has been a prime target for the development of computer programmes and these are available on most of the popular microcomputers. A typical package will hold between 250 to 900 nominal accou. t headings and between 2,500 to 4,000 transactions. The routines for posting the transactions will be so structured that each prime entry source will be posted automatically to the respective nominal account.

Nominal account coding can be defined to suit each client. The format of the accounts can be used to provide an outline sequence within which to create the accounts code list. It is advisable to allocate the coding in blocks that wilt allow additional accounts to be opened without destroying this sequence. It is impossible to define this structure without knowing tlie coding facility of a particular package or the requirements of the client.

One example using a four-digit structure could be as follows:

Accounts Code	General Ledger
1000	Fixed assets
2000	Current assets
3000	Current liabilities
4000	Capital
5000	Reserves

Within each group up to 999 accounts might be available to allow for the detailed analysis. With the Reserves group (in the illustration the 5000 series), more numbers are available to be allocated to revenue and expenses items to be identified in the profit and loss account. In this latter case, the series numbered 6000 onwards could be used to create a profit or cost centre analysis within the profit and loss account.

A common feature of many of these packages will be the automatic calculation of deprecation using preset depreciation parameters. Reports generated will usually include:

* Trial Balance
* Bank and Cash Reconciliation
* Adjustments Analysis
* Fixed Assets Schedule
* Nominal Ledger Accounts in Detail
* Profit and Loss Account
* Balance Sheet
* Source and Application of Funds,

Most programmes now offer perhaps the most useful facility of all, namely the preparation of a full set of final accounts, including notes to tlie accounts and the director's report. However, it must be said that some systems will not print to a particularly high standard and you may be unable to use the printout from the machine for presentation.

Integrated Purchase/Sales/General Ledger: There are several packages available which offer the above reports either as individual modules or as an integrated system. One of these has been already discussed earlier In addition, systems are now offered which link tlie sales and purchase ledgers to a stack control

programme, and the sales ledger to an invoicing programme. Most systems offer either 'open item' or 'balance brought forward' on each account. Naturally, the oper, item system offers a more comprehensive service – balance brought forward being ideal for smaller businesses whose accounts is cleared monthly.

The system will create the double entry within the general for all postings through the sales and purchase ledgers. Journal entries to the general ledger will only be accepted if tlie debits and credits equate to zero, as will input through the purchase and sales ledger, thereby ensuring that the trail balance must always balance. Additionally, pay roll and job costing may be linked to the general ledger to produce final accounts and other management information.

Other Financial Systems

A typical system will offer around 800 accounts and 4,000 to 6,000 postings per month. It will hold details of customer's accounts and register all sales transactions. Initially, the user will be presented with a 'menu' of the various routines available from which the required routine is chosen, as shown in *Figure* 11.9

XYZ Limited	Sales Ledger Menu

SALES LEDGER
Press the required number
1. Master file update
2. Master file print
3. Batch posting
4. Account enquiry
5. Cash allocation
6. Month end routine

Figure 11.9: A Typical Menu

The customer master file will hold tlie name, address and the telephone number, credit limit account balance 3 to 4 months old, turnover statistics, sales territory codes etc. The transaction file will hold details entered into the system together with all invoices, credits, adjustments and cash items posted during the current financial periods.

11.9 COMPUTER AIDED FINANCIAL PLANNING

Plans have a central role to play in a company's decision-making process. To do this effectively they often need to present a number of alternative evaluations based on different assumptions and different ideas for new projects, product introduction and the like. Mere, then is the fundamental defect of manual planning and budgeting methods, a defect, which can often be overcome by the use of computerised methods. The plans, to be of any use, must be easy to produce answers in a number of 'what if?' formats:

'What happens if we give: an extra discount of 5 per cent for orders over Rs. 1000 resulting in increased sales volume of 2 per cent?'

'What happens if it only gives 1 per cent extra?'

'What if we keep the old version going for a further year and hold the price, at the same time deferring its replacement and putting in Rs. 1,00,000 more for development?'

'What if we open a new warehouse in Bhopal in two years' time which takes 10 percent of the volume from Delhi and 25 percent from Bombay while sales go **up** by 15 per cent in each region and how full will the three warehouses be?'

'What does the picture look like if we run all three ideas (above) together next year?'

'What will change if we defer the new warehouse for a further year?'

'What if we put on a second shift with a 30 per cent premium on wages but at the same time stop all production overtime?'

Given a calculator, large sheets of paper, the basic information and peace and quiet, any one of the above questions could be evaluated by most accountants or managers. The work is quite straightforward. It would not be so easy to find the time to work through all of them. But this is a scenario familiar enough in most companies, and often it results in decisions having to be taken without an adequate evaluation being completed. This is not so because there is, as is so often alleged, 'a lack of information on which to base the decision' but rather because there is insufficient time to work through all the options with pen and paper.

1. A	B	C	D	E	F	G	H	I	J	K	L	M	N
CASH PROJECTION													
2.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
3. CASH RECEIPTS													
4. Small Builders	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Distributors	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Private Customers	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Others	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	-	-	-	-	-	-	-	-	-	-	-	-	-
9. TOTAL RECEIPTS	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	-	-	-	-	-	-	-	-	-	-	-	-	-
11. CASH PAYMENT													
12. Timber Suppliers	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Misc. Mat Suppliers	0	0	0	0	0	0	0	0	0	0	0	0	0
14. Wages	0	0	0	0	0	0	0	0	0	0	0	0	0
15. Rent and Rates	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Other Overheads	0	0	0	0	0	0	0	0	0	0	0	0	0
17. Interest	0	0	0	0	0	0	0	0	0	0	0	0	0
18. Drawings	0	0	0	0	0	0	0	0	0	0	0	0	0
19. Tax payments	0	0	0	0	0	0	0	0	0	0	0	0	0
20.													
21. Total Payments	0	0	0	0	0	0	0	0	0	0	0	0	0
22.													
23. Opening Bank 'O' Dft	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
24. Total Receipts	0	0	0	0	0	0	0	0	0	0	0	0	0
25. Total Payments	0	0	0	0	0	0	0	0	0	0	0	0	0
26. Closing Rank 'O' Dft	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

Figure 11.10: Computerised Spreadsheet: An Example

Other difficulties with manual systems, which admittedly can be partially alleviated by use of the more sophisticated types of calculator, include working out discounted cash flows and other types of evaluation of returns on investment. A computer, however, will drastically reduce the time taken.

Lastly, once a range of options has been worked out, they need to be looked at from a variety of points of view, normally covering their impact on:

a) Profitability

b) Cash flow

c) Capital requirements

d) Balance sheet

This in turn brings about a need for a great deal of further work if the full picture is to be collated each time tlie plans are in any way changed, and further underlines the fact that such an exercise is unlikely to be completed adequately, if at all, with annual methods alone.

Solutions Offered by **Computers:** Computers offer a variety of solutions to planning problems. They are often referred to as 'number cruncliers', and this is very much the job they do when used in any planning application. But the use of computers in planning still leaves a number of other problems unchanged. The relevant information for input to tlie planning activity still has to be available in a suitable form. Chaotic accounting and control systems will not be of much use in providing it. The onus is still on management to think up new projects, ideas and products to bring the plans to life. Assumptions still have to be made about everything from the likely rate of inflation to tlie possible markets.

Without innovative thinking, there can be no plans, computerised or otherwise. Before they can form part of the plans, projects and ideas have to be investigated and coasted. There is still a great deal of this and other preliminary work to be done manually. The computer's role is to take over the calculations, and allow a very large number of options to be evaluated in a very short time.

11.10 SUMMARY

This Unit lias attempted to introduce various concepts related to Production/ Operations and Finance.

We have retouched upon definition of transaction processing systems and discussed about the new focus of a Production/Operations System. We have discussed about two types of inventory management systems: Independent demand and dependent demand. The unit lias further discussed the tremendous progress that has been achieved in tlie use of IT in both tlie maintenance management and engineering functions.

We have identified various computer based application systems and discussed in detail about general ledger systems. We have also identified some problems encountered with their implementation, We have also examined computerised financial planning software.

11.11 UNIT END EXERCISES

1) What is change in the focus of operations management? Is this change in tlie focus is due to the increase of competitiveness in Business? Elaborate.

2) What are the types of inventory management systems? Define them and partition them into further classes. Also, briefly explain each subdivision.

3) Wliat is computerized maintenance management? Explain tlie conceptual model through which the maintenance function can achieve its objectives on a sustained basis.

4) How the financial systems, facilitated by computer software, are important for economy of data processing and administrative efficiency?

5) Computers are often referred to as 'number crunchers'. Evaluate the statement in tlie context of financial planning.

6) What are the main features of a computerised General Ledger System?

11.12 REFERENCES AND SUGGESTED FURTHER READINGS

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